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SC 7000 and SC 9000XL Patient Monitors
SC 9000XL Monitor 12in (30.5cm) Display

Service Manual Supplement Two

EM Guidelines, 1997-04-02

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1 Introduction

Information in this supplement is applicable to only SC 9000XL monitors factory equipped with a 12" (30.5cm) Display. It replaces information in the SC 7000 and SC 9000XL Patient Monitors Service Manuals as indicated below.Refer to either the printed version of the Service Manual (Art. No. 5949016E539U) and Supplement (Art. No. 5952416E539U) or to the CD-ROM version (Art. No. 5944090E539U) for all other service information.

N.B: The 12" (30.5cm) Display Front Bezel Subassembly is not compatible with and cannot be installed on SC 7000 Monitors nor on SC 9000XL Monitors factory equipped with 10.4" Displays.

Section references used in this supplement refer to the section numbers in the printed Service Manual or CD-ROM. Changes impact primarily Chapter 3, Repair, and Appendix A, Replacement Parts.

Chapter 3

The impacted sections of Chapter 3 in the Service Manual are reproduced below with appropriate changes. Some text and graphics that remain unchanged from the material in the Service Manual, are included below as a convenience. Sections NOT rewritten below, remain unchanged.

5 Opening Monitor

Before attempting to open the monitor, always do the following:

- Remove all attached modules and unplug all cables from the monitor.
- Disconnect all external power sources, remove external battery (if installed), and remove back cover and unplug cable from main battery.
- Assure that both you and the work area are properly protected against static-electricity discharge.

5.1 Removing/Installing Side-Panels

Refer to procedure in Service Manual.

5.2 Separating Front Bezel Subassembly and Rear Housing Subassembly

After left and right side panels have been removed, opening the monitor consists of separating the front bezel and rear housing subassemblies. The subassemblies are secured to each other by two locking tabs on the rear housing at the bottom of the front bezel and two locking plates that secure the top of the bezel to the rear housing (see Figure 3-7).

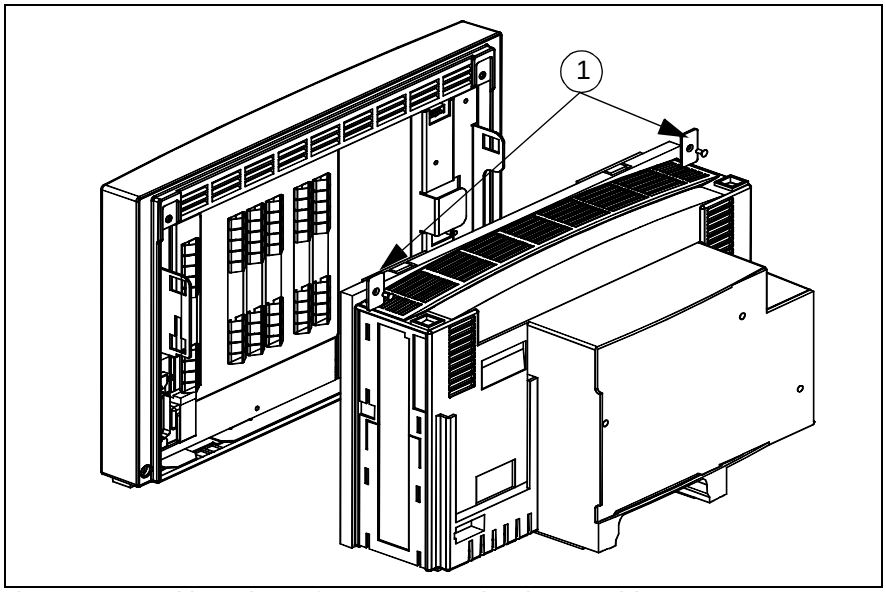

Figure 3-7 Locking Plates for Front Bezel Subassembly

1 Place monitor in its upright position, with back of monitor facing you.

2 Remove and save two screws and locking plates (see ① in Figure 3-7) that secure top of Front Bezel Subassembly to rear housing.

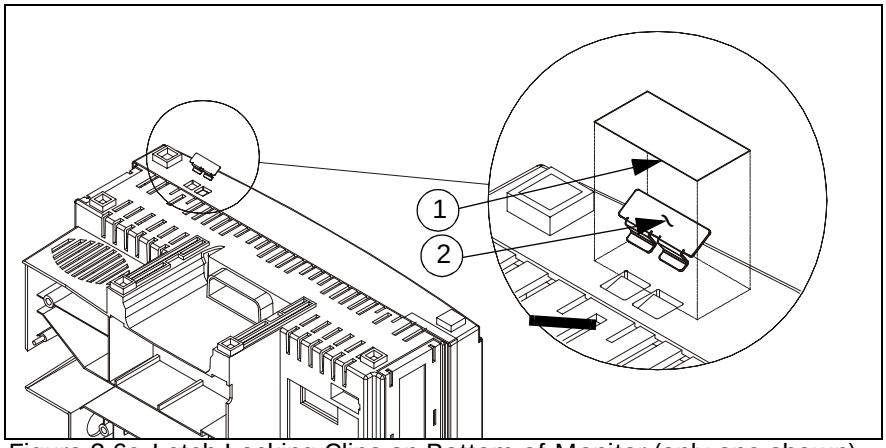

Figure 3-6a Latch Locking Clips on Bottom of Monitor (only one shown)

3 Turn monitor topside down, as shown in Figure 3-6a if locking clips are installed. If locking clips are not installed, go to step 5.

4 Peel off and save tape (① in Figure 3-6a) and remove and save locking clips (② in Figure 3-6a) from the two latches on the bottom of the monitor.

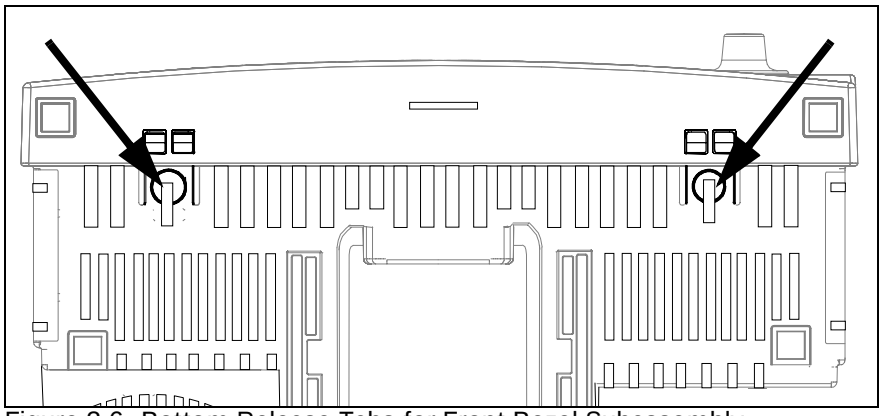

Figure 3-6 Bottom Release Tabs for Front Bezel Subassembly

5 Place monitor backside down with bottom of monitor facing you as shown in Figure 3-6.

6 Press in firmly on thumb depressions on bottom of monitor to release latches (see arrows in Figure 3-6), and pull up on bezel to slightly separate left side of Front Bezel Subassembly from Rear Housing Subassembly.

7 Carefully pull right-hand side of Front Bezel Subassembly up from rear housing to unplug interfacing connector on back of front bezel PC board from corresponding connector on main processing board.

8 Lift Front Bezel Subassembly off of rear housing to separate the two subassemblies.

9 Store subassemblies in safe location as necessary.

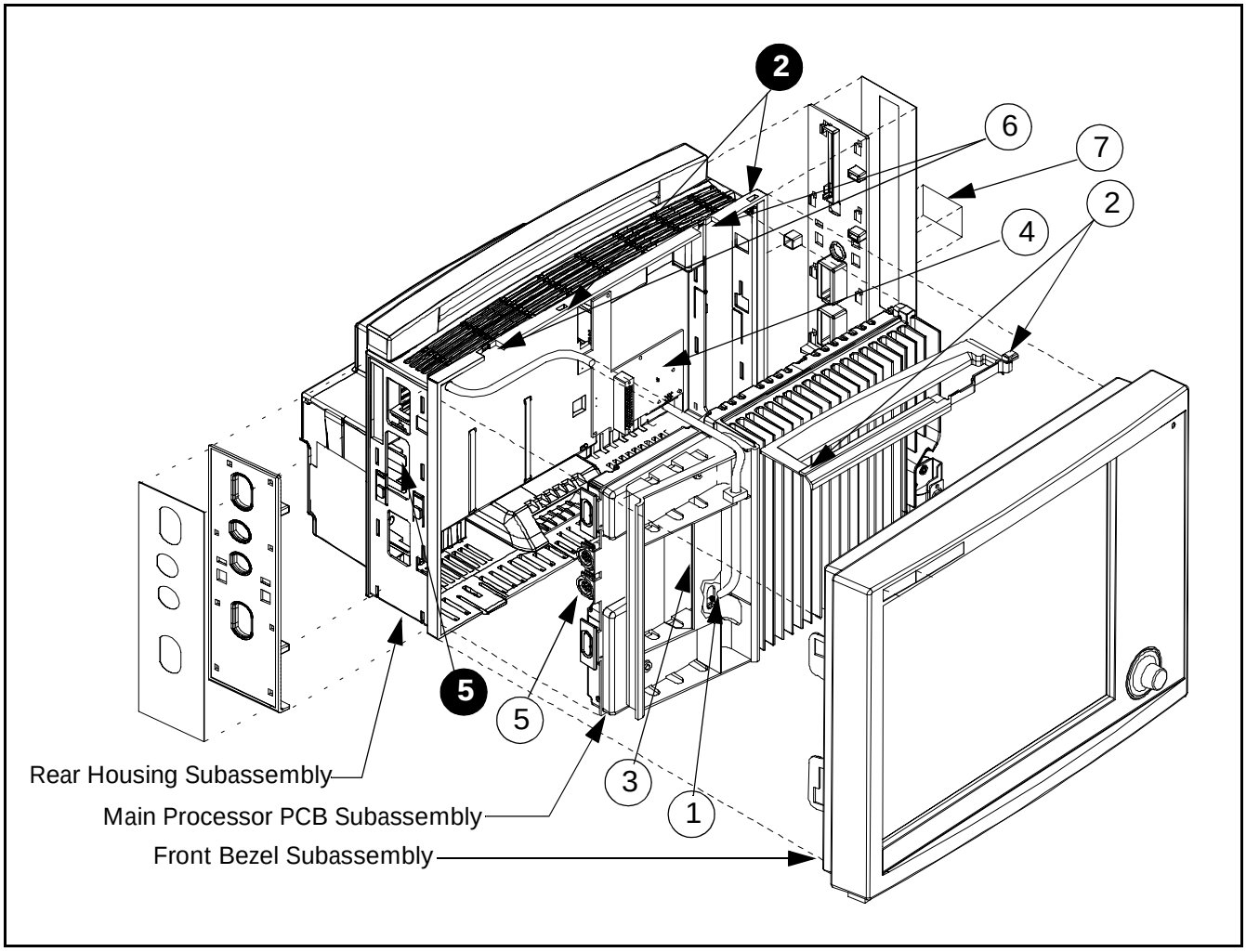

Figure 3-8 (replacement) SC 9000XL w/ 12in (30.5cm) Display - Rear Housing Subasssembly, Main Processor PCB Subassembly, and Front Bezel Subassembly

6 Replacing Subassemblies in Rear Housing

Locking tabs in the rear housing have been removed (see ⑥ in Figure 3-8) to accommodate the 12in (30.5cm) Front Bezel Subassembly. With the exception of a slight change in the remove/install procedure for the funnel, however, all other procedures in this section of Chapter 3 in the Service Manuals remain unchanged.

Note: Items ①, ③, ④, ⑤ and item ❺ in Figure 3-8 correspond to text references in the SC7000 and SC9000XL Service Manuals. Items ②, ❷ and ⑥ are references for this supplement. Item ⑦ is a label that is removed for DirectNet operation of the Monitor.

6.1 Removing/Installing Funnel

The funnel has no locking tabs (② in Figure 3-8) but rather slides into channels designed to provide a snug fit in the top of the rear housing.

- To remove the funnel, grasp it firmly in the area of the former tab slots (❷ in Figure 3-8) and carefully work it out of the channels.
- To reinstall the funnel, slide it firmly into the guide channels, and seat it against the lip on the back of the main PC board heat sink.

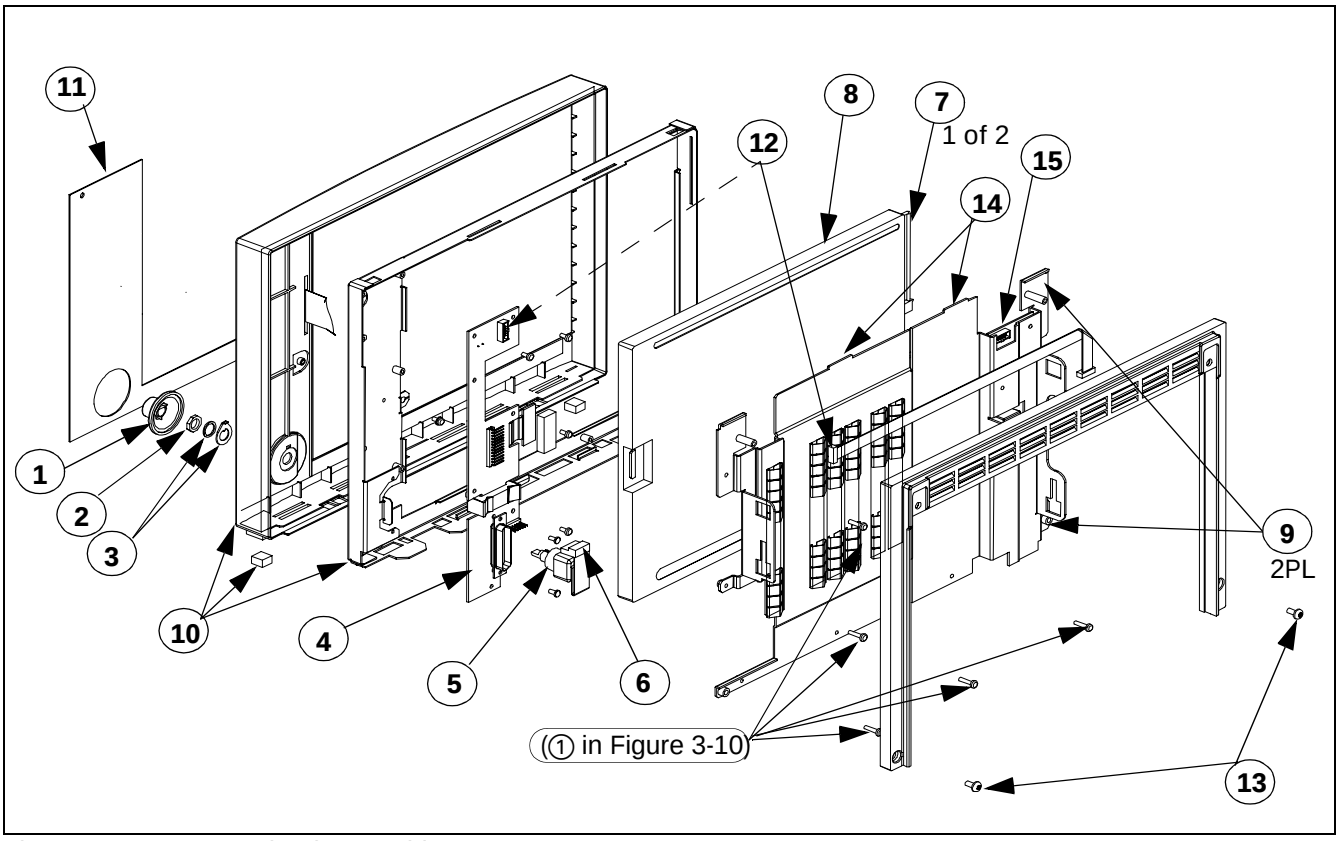

Figure 3-9 Front Bezel Subassembly Components.

7 Accessing Replaceable Subassemblies in Front Bezel Subassembly

Replaceable components of the Front Bezel Subassembly are as follows:

- Optical Encoder Subassembly (①, ②, ③, and ⑤ in Figure 3-9, also see Figure 3-11 on page 8)
- Front Bezel PC Board Subassembly (④ in Figure 3-9)
- Front Bezel/Lens Subassembly (⑩ in Figure 3-9, includes bezel with installed membrane switches, lens, metal bezel frame, Siemens logo and model labels, and feet)
- Backlight Lamps (⑦ in Figure 3-9, also see Figure 3-12 on page 10)

Note: The Front Bezel Subassembly is also available for replacement as a complete subassembly, (except for language label ⑪ which must be ordered as a separate kit).

- Backlight Inverter PC Board (⑮ in Figure 3-9)

7.1 Removing Plastic Frame and Metal Retainer Plate

After opening monitor, (see Section 5 on page 3) remove the plastic frame and metal retainer plate from the Front Bezel Subassembly to access all replaceable components (except the rotary knob) in the subassembly.

7.1.1 Removing Plastic Frame and Metal Retainer Plate

1 With Front Bezel Subassembly separated from rear housing and laying face down on a smooth clean surface, remove and save two screws (⑬ in Figure 3-9 on page 6) that secure plastic frame to retainer plate at bottom left and right of frame.

2 Lift frame out of subassembly and set aside for use in reassembly.

3 Unplug backlight connectors (⑦ in Figure 3-10) from Backlight Inverter PC Board.

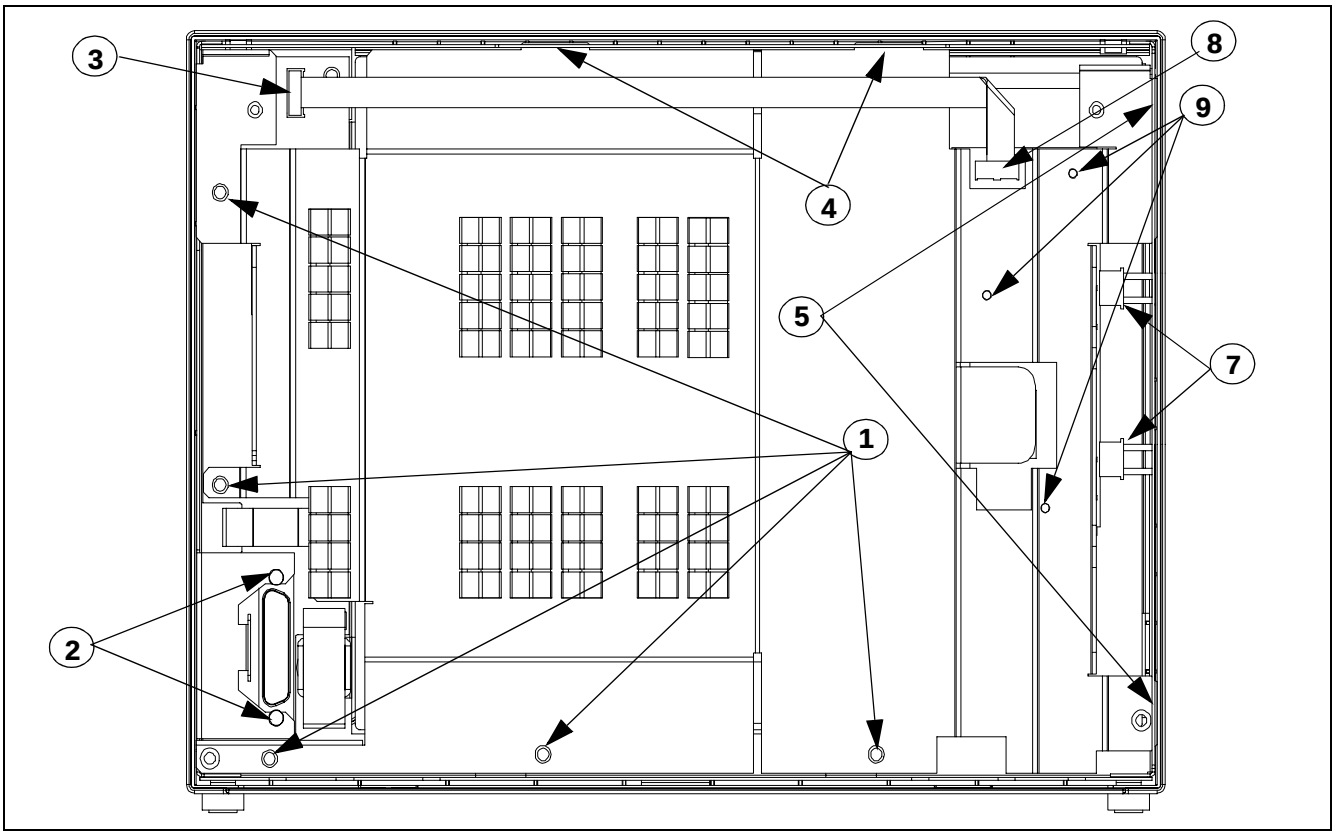

Figure 3-10 Front Bezel Subassembly - Interior View, Plastic Frame Removed

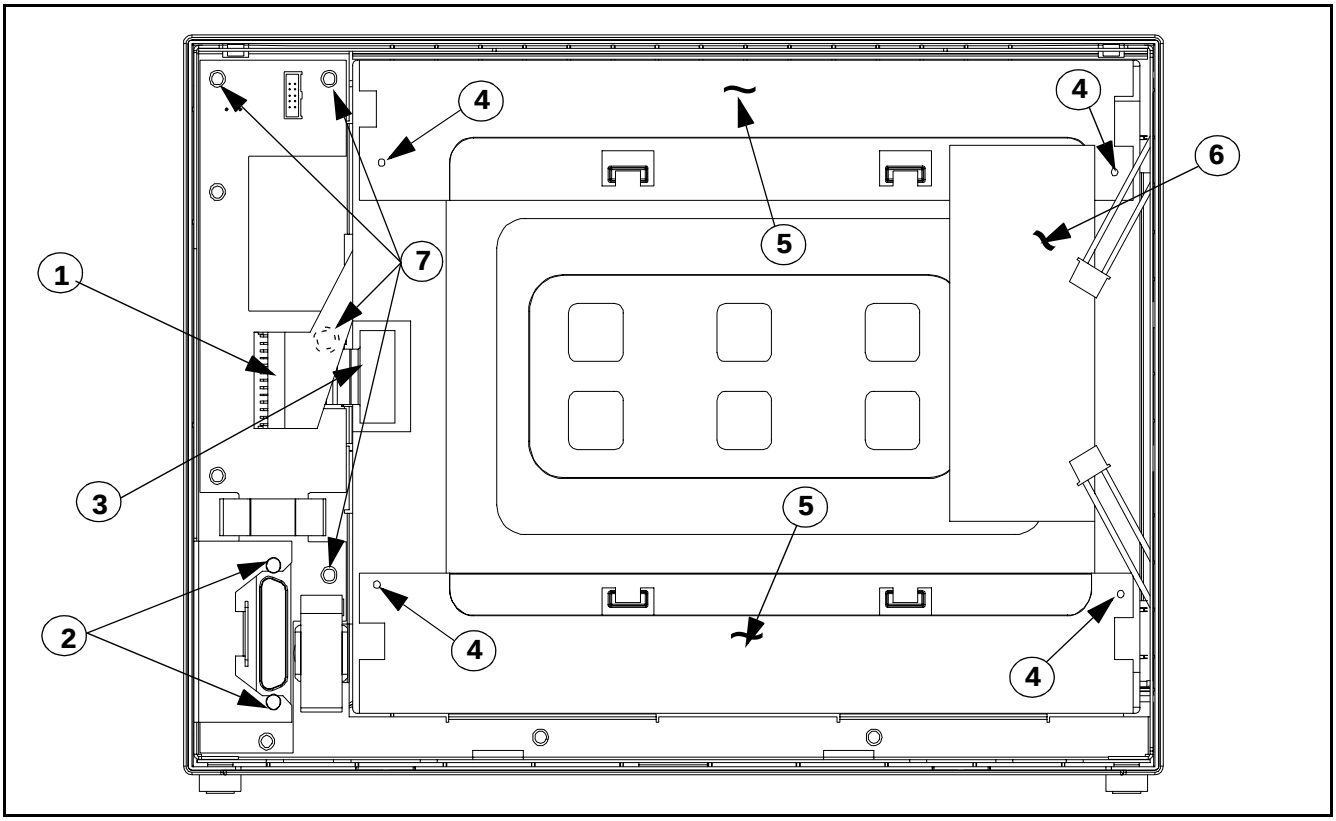

Figure 3-10a Front Bezel Subassembly - Interior View, Retainer Plate Removed

4 Unplug display backlight PC board ribbon cable connector from Front Bezel PC Board (⑫ in Figure 3-9; ③ in Figure 3-10).

5 Remove and save five screws (① in Figure 3-10) that secure retainer plate to metal front bezel frame.

6 Move retainer plate slightly left to slide tabs on right hand side of plate (⑨ in Figure 3-9; ⑤ in Figure 3-10) out of slots in side of metal frame.

7 Lift bottom edge of retainer plate and slide plate out of slots (⑭ in Figure 3-9; ④ in Figure 3-10) in top of metal frame, and set aside for use in reassembly.

7.1.2 Reinstalling Plastic Frame and Metal Retainer Plate

Reverse steps of Section 7.1.1 to reinstall metal retainer plate and plastic frame in Front Bezel Subassembly.

7.2 Backlight Inverter PC Board Replacement

The Backlight Inverter PC Board (⑮ in Figure 3-9 on page 6) is mounted on the back side of the retainer plate inside the Front Bezel Subassembly. To replace the Backlight Inverter PC Board do the following:

Removing PC Board

1 Open monitor and remove retainer plate.

2 Unplug backlight ribbon cable connector (⑧ in Figure 3-10) from Backlight Inverter PC Board, and save cable for use in reassembly.

3 Remove and save three screws (⑨ in Figure 3-10) securing Backlight Inverter PC Board to retainer plate.

Installing PC Board

1 Locate replacement board in position on back side of retainer plate, and secure with screws removed in step 2.

2 Plug backlight ribbon cable connector into Backlight Inverter PC Board, reinstall retainer plate and close monitor (see Section 8).

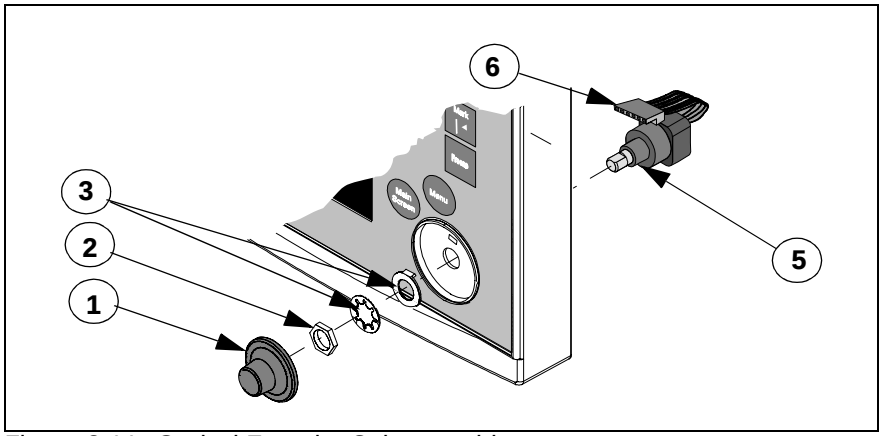

Figure 3-11 Optical Encoder Subassembly.

7.3 Optical Encoder Subassembly

Use the following procedure to remove / install the Optical Encoder Subassembly.

7.3.1 Removing Optical Encoder Subassembly

1 Remove and save plastic frame and retainer plate from Front Bezel Subassembly (see Section 7.1.1 on page 6).

2 Remove rotary knob (① in Figure 3-9 on page 6 and in Figure 3-11.

Note: Rotary knob is press fitted onto metal shaft of Optical Encoder Subassembly and must be removed very carefully to be reinstalled. To remove knob pull it straight out and off of metal shaft. It may help to wrap some removable tape around knob to get a better grip.

3) Unplug optical encoder ribbon cable connector (⑥ in Figure 3-9 and Figure 3-11) from front bezel PC board.

4) Refer to Figure 3-9 on page 6 or Figure 3-11. Unscrew nut ② securing optical encoder shaft in position in front bezel, and remove Optical Encoder Subassembly ⑤ through back of bezel. Save nut, and lock washer / positioning washer combination ③ for use in reassembly.

7.3.2 Installing Optical Encoder Subassembly

1 Slide Optical Encoder Subassembly shaft through hole in front bezel, positioned such that keyway on shaft is toward top of front panel.

2) Slide positioning washer removed in step 4 of Section 7.3.1 above onto subassembly shaft so tab on hole in washer slides into keyway on subassembly shaft and locking tab on washer is into hole in front bezel above shaft.

Note: This assures that Optical Encoder Subassembly is positioned so that its ribbon cable connector plugs properly into the front bezel PC board and the subassembly doesn't rotate in subsequent use.

3) Slide lockwasher and nut removed in step 4 of Section 7.3.1 above onto subassembly shaft, and tighten to secure subassembly in bezel.

4) Plug optical encoder ribbon cable connector into front bezel PC board.

5) To reinstall knob, align and firmly press knob onto shaft.

6) Reinstall retainer plate and plastic frame in Front Bezel Subassembly (see Section 7.1.2 on page 8), and reassemble Monitor. Refer to Section 8 on page 11.

7.4 Front Bezel PC Board

7.4.1 Removing Front Bezel PCB

In addition to removing the plastic frame and retainer plate w/ attached backlight power supply PC board, it is necessary to remove the Optical Encoder Subassembly, and Display Screen Subassembly, to access and remove the Front Bezel PC Board.

1 Remove plastic frame and retainer plate (see Section 7.1.1 on page 6), and Optical Encoder Subassembly (see Section 7.1.2 on page 8).

2 Unplug membrane switch ribbon cable connector (① in Figure 3-10a on page 7) from front bezel PC board, and display screen flex cable connector (③ in Figure 3-10a) from display screen subassembly PC board.

3 Slide small screwdriver under tab near bottom on right hand side of display subassembly, and carefully lift Display Screen Subassembly (⑧ in Figure 3-9) out of front bezel frame. Set subassembly aside on a **clean** flat surface for use in reassembly.

Note: Be very careful that no dust or other foreign matter gets on the front bezel lens or on the display screen surface.

4 Remove and save two screws (② in Figure 3-10 and Figure 3-10a) that secure front bezel PC board interface connector to mounting tabs on bezel frame.

5 Remove and save four remaining screws (⑦ in Figure 3-10a) securing front bezel PC board to bezel frame.

6 Lift bottom right hand side of front bezel PC board off of bezel frame, and slide board out from under interface connector mounting tabs to remove board.

7.4.2 Installing Front Bezel PC Board

1 With Optical Encoder and Display Screen Subassemblies removed, and front bezel laying face down, bottom facing you, slide front bezel PC board into position on mounting posts on bezel frame.

Note: Be sure that interface connector housing slides under bezel frame connector mounting tabs.

2) Install screws removed in step step 4 of Section 7.4.2 above into interface connector housing but do not tighten until step 4 below.

3) Install screws removed in step step 5 of Section 7.4.2 above, and tighten to secure front bezel PC board to front bezel frame.

4) Tighten screws installed in step 2 to secure interface connector housing to front bezel frame.

5) Locate Display Screen Subassembly in front bezel frame and press to seat subassembly into position.

Note: Be very careful that no dust, finger prints, or other foreign matter is on the front bezel lens or on the display screen surface.

6) Refer to Figure 3-10a on page 7. Plug display screen flex cable connector ③ into display screen subassembly PC board, and membrane switch ribbon cable connector ① into front bezel PC board.

7) Reinstall Optical Encoder Subassembly (see Section 7.3.2 on page 9).

8) Reinstall retainer plate and plastic frame (see Section 7.1.2 on page 8).

9) Reassemble monitor. Refer to Section 8 on page 11.

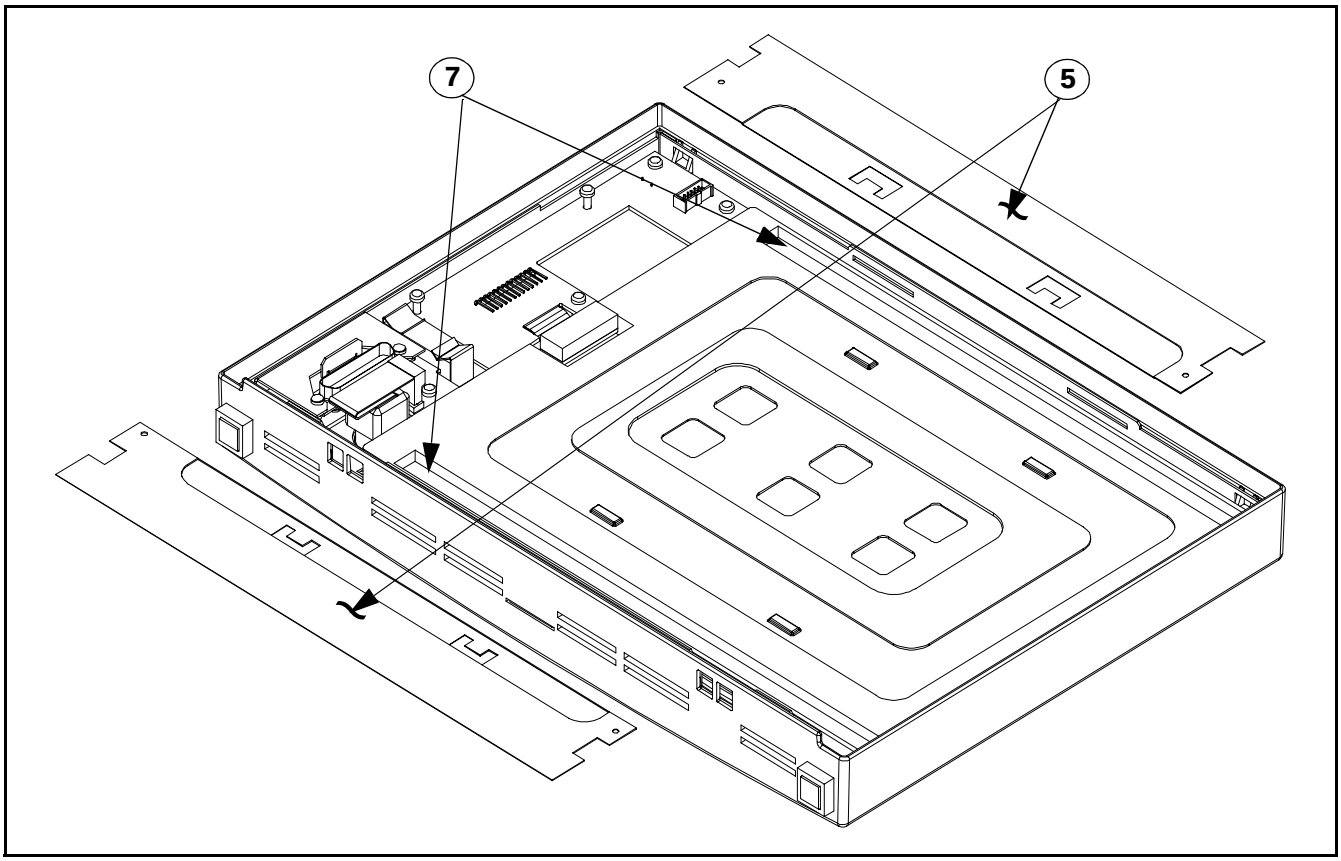

Figure 3-12 Display Subassembly - Display Backlight Covers Removed

7.5 Replacing Backlights

The backlight fluorescent lamps are located inside the Display Screen Subassembly (⑧ in Figure 3-9 on page 6). It is not necessary to remove the Display Screen Subassembly from the Front Bezel Subassembly to replace backlights. Use the following procedure

1 Remove and save plastic frame and retainer plate from Front Bezel Subassembly (see Section 7.1.1 on page 6).

2) Carefully peel back insulating tape (⑥ in Figure 3-10a on page 7) just enough to access top backlight cover (see ⑤ in Figure 3-10a and in Figure 3-12).

3) Using very small Phillips-head screwdriver, remove and save four screws (④ in Figure 3-10a on page 7) that secure backlight covers (⑤ in Figure 3-10a and in Figure 3-12) to Display Screen Subassembly.

4) Slide backlight covers toward center of Display Screen Subassembly to release tabs, and lift covers off to access backlights (see ⑤ in Figure 3-12 on page 10).

5) Observe positioning of backlights in channels (⑦ in Figure 3-12) , and install replacement backlights in identical manner.

6) Reinstall backlight covers, making sure that tabs lock into display sub-assembly cover, and secure in place using screws removed in step 3.

7) Reinstall retainer plate and plastic frame (see Section 7.1.2 on page 8).

8) Reassemble monitor. Refer to Section 8 on page 11.

7.6 Front Bezel/Lens Subassembly

A replacement Front Bezel/Lens Subassembly ships with an installed lens, mounting frame, Siemens logo and Model labels, and feet. The Language Label Set (see ⑪ in Figure 3-9) must be ordered separately,

1 Open monitor (see Section 5 on page 3).

2 Remove LCD Display Subassembly, Optical Encoder Subassembly, Front Bezel PC Board Subassembly, retainer plate, and plastic frame from original front bezel subassembly and install in replacement bezel. Refer to Sections 7.1, 7.3, and 7.4.

3 Install language label appropriate for customer site. Refer to old front bezel as model, and to SC7000 and SC9000XL Patient Monitors Service Manual for procedure.

4) Reassemble Monitor. Refer to Section 8.

7.7 Front Bezel Subassembly

A replacement Front Bezel Subassembly ships with Monitor Model label, LCD Display Subassembly, Optical Encoder Subassembly, Front Bezel PC Board Subassembly, Backlight Inverter PC Board, and retainer plate installed. Only the language label (ordered separately from replacement front bezel) needs to be installed on the bezel before closing the monitor. Refer to section 4.2 in the Service Manual to install label, and then refer to Section 8 in this supplement to close monitor.

8 Closing Monitor

1) With Rear Housing Subassembly backside down, position Front Bezel Subassembly such that positioning guide on front bezel interfacing connector slides into guide channel on rear housing connector, and guides on sides and bottom of subassembly are partially inserted along sides and botom of rear housing subassembly.

2) Assuring that interfacing connectors are properly aligned, carefully press the two subassemblies together until two locking tabs on

bottom of rear housing seat properly in front bezel and lock the bottom of the two subassemblies together.

3) Reinstall locking plates at top of front bezel to pull bezel tightly against rear housing.
4) Reinstall left and right side panels and ejector shaft cover. Refer to Sections 5.1.2, 5.1.4, and 5.1.6 in the Service Manual.
5) Reinstall locking clips, if previously installed. See Figure 3-6a on page 4.
6) Reconnect battery power and reinstall rear cover.
7) Functionally verify proper operation of the monitor before returning the monitor to clinical service. Refer to Chapter 4, Functional Verification, in the SC 7000 and SC 9000XL Patient Monitors Service Manual.

Appendix A

The following information is in addition to information already published in Appendix A of the SC 7000 and SC 9000XL Patient Monitors Service Manual (Art. No. 5949016E539U) and Supplement (Art. No. 5952416E539U) and to the CD-ROM version (Art. No. 5944090E539U)

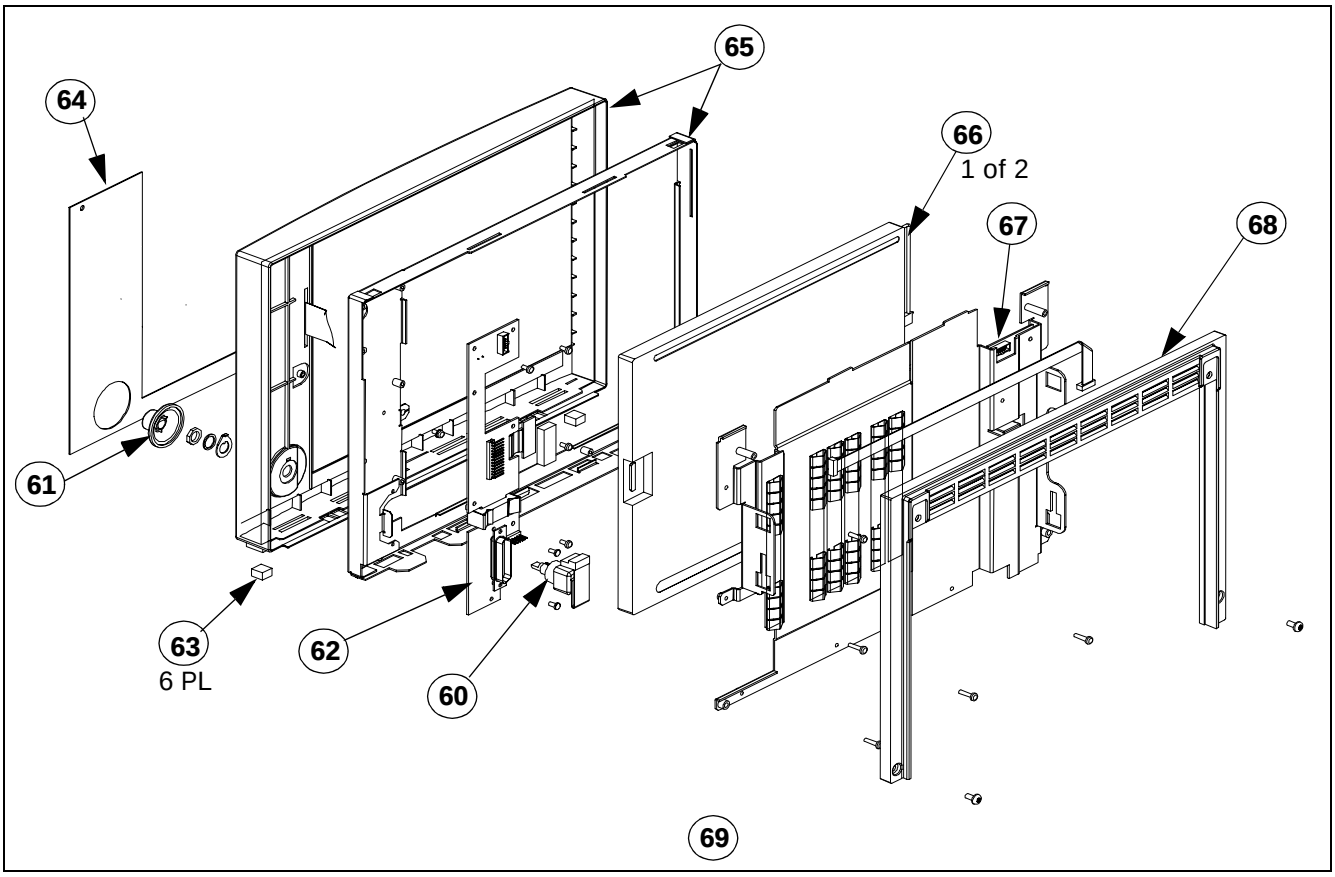

Figure A-5 Front Bezel Subassembly Components

Table A-5 Front Bezel Subassembly - Replaceable Parts/Subassemblies

Item No.	Description	Siemens Article Number
60	Optical Encoder SC Series	43 11 622 E533U
61	Rotary Knob SC Series	43 16 662 E533U
62	Front Bezel PC Board Subassembly	59 50 006 E539U
63	Foot .40 SQ X .25 THK (Pkg -12)	43 11 374 E533U
64	Language Label Kit	59 53 877 E539U
65	Front Bezel/Lens Subassembly (incl. installed item 63)	59 44 959 E539U
66	E/M SPR BACKLIGHT 12.1 TFT LCD	59 54 347 E539U
67	Backlight Inverter PC Board Subassembly	59 50 022 E539U
68	Plastic Mounting Frame	57 42 841 E539U
69	Front Bezel Assembly (incl. all subassemblies in front bezel except language label)	59 44 934 E539U

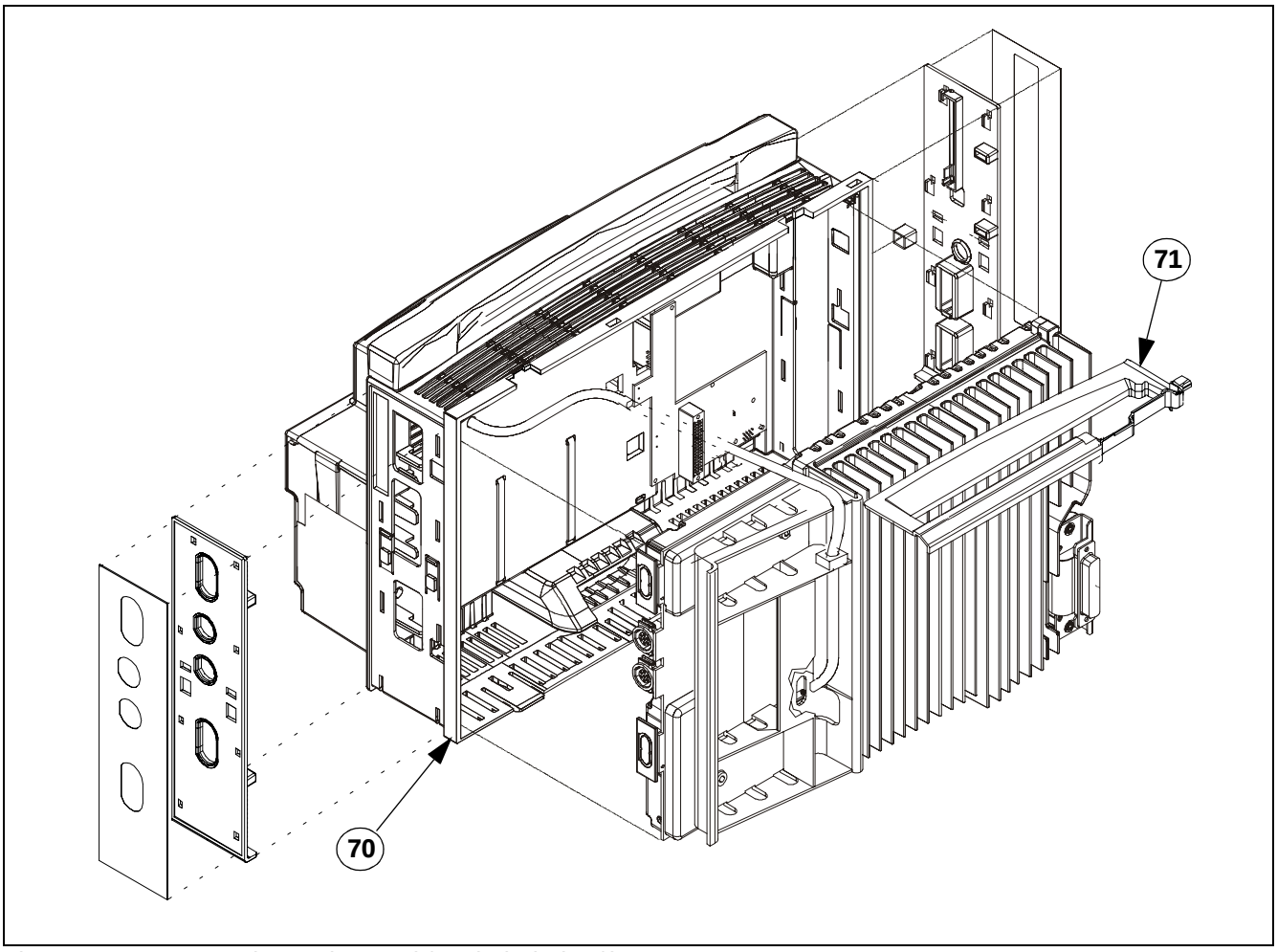

Figure A-6 Rear Housing and Funnel (Exploded View)l

Table A-6 Rear Housing and Funnel

Item No.	Description	Siemens Article Number
70	Rear Housing Subassembly (incl. Connector I/O PCB)	59 52 945 E539U
71	Funnel	57 33 139 E539U

Note: For all other replaceable components in the Rear Housing Subassembly, refer to Figures A-1 and A-3 in the SC 7000 and SC 9000XL Patient Monitors Service Manuals.

If procedures in this Supplement are performed by other than Siemens service personnel, for more information contact your local Siemens service representative. Technical support for Siemens service personnel is available as follows:

In North and South America:

Siemens Medical Systems, Inc.

EM-PCS

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Danvers, MA 01923 USA

Tel: (978) 907-7500

FAX (978) 907-7546

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